

Applicant: Joseph G. Murphy et al.
U.S.S.N.: 09/431,758
Filing Date: November 1, 1999
EMC Docket No.: EMC-99-060

REMARKS

The Office Action mailed July 8, 2003 has been carefully considered. Claims 1-3, 5-7, 10, 13-20 have been amended. Claims 21- 24 have been added. Claims 1-24 remain in the case. Reconsideration and allowance of the subject application, as amended, is respectfully requested.

The Examiner has rejected claims 1-20 under 35 U.S.C. 112, second paragraph as being indefinite. Claims 1-20 have been amended to overcome the Examiner's rejection and clear up matters of form. Applicants respectfully submit that no new matter is added by these amendments.

The Examiner has rejected Claims 1-7, 10-12, and 16-20 under 35 USC 102(e) as being anticipated by U.S. Patent 6,253,240 to Axberg et al. (Axberg). This rejection is respectfully traversed with respect to the remaining claims in light of the amendments to the claims and the following remarks.

Applicant's invention provides a method and network architecture for the management of a storage area network by one or more clients independent of the storage area network. The storage area network includes a storage system including a plurality of storage devices and a multiple host computers connected to the storage system through a first communications network. Each host computer includes at least one agent for transmitting data to and retrieving data from one or more of the plurality of storage devices. A storage management server is provided between the independent clients and the plurality of storage devices in the storage area network. Information relating to the configuration of the storage system is provided to the storage management server from the at least one agent. Then, the storage management server is

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adapted to connect to the clients via a web-based second communications network and provides the information to at least one of the clients and an object-oriented dynamic linking mechanism for ensuring that the at least one independent client is able to access the storage management server.

Axberg, on the other hand, is directed toward a graphical user interface display for configuring a storage network. In Axberg, all of the disclosed interactions are between the manager and the agents residing the storage area network it manages. Axberg's system is essentially a closed loop. While Axberg discloses both manager-agent interactions in which the manager is acting as a server and the agent is acting as a client, and manager-agent interactions in which the agent is acting as a server and the manager is acting as a client (Axberg, col. 14, lines 10-40 and Fig 1), nowhere does Axberg teach or disclose interactions between a storage management server and clients which are independent of the storage area network. These features of the invention, as well as the web-based second communications network and the object-oriented dynamic linking mechanism which support them, are described, for example in Applicants specification at page 7, lines 3-16 and Figs 1 and 4, and specifically claimed in Applicant's amended claims 1 and 16. Axberg does not disclose a web-based second communications network external to Axberg's hosts and manager, and indicates that the preferred communications path for client-server interactions is a wired local area network (Axberg col 6, lines 44-48). Nor does Axberg disclose an object-oriented dynamic linking mechanism such as Applicants' for ensuring that the at least one independent client is able to access the storage management server. Axberg does disclose an object for performing remote procedure calls to local agents (Axberg, col 30, lines 40-45, and for identifying unknown objects

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provided by the agents from hosts known to Axberg's manager (Axberg, col 36, lines 5-22 and col 37, lines 3-20) but, because Axberg's manager communicates with a closed, known storage network only, Axberg does not need or provide for an object-oriented dynamic linking mechanism such as Applicants' for ensuring that the independent clients are able to access the storage management server. As Applicants point out in their specification at page 7, lines 14-16, this has the advantage of allowing a storage area network to be monitored from virtually anywhere in the world.

Claims 2—7, and 10-15 are dependent on claim 1 and claims 17-20 are dependent on claim 16, so these claims are allowable for at least the reasons cited above. Moreover, with respect to claims 5-7 and 20, Axberg does not disclose providing or managing information relating to the operation of storage connectivity devices such as hubs and switches, because Axberg does not teach or disclose the use of a communications network involving such devices.

The Examiner has rejected Claims 8, 9, 13 and 14 under 35 USC 103(a) as being obvious over U.S. Patent 6,253,240 to Axberg et al. (Axberg) in view of U.S. Patent 6,330,572 to Sitka (Sitka). The Examiner has also rejected Claim 15 under 35 USC 103(a) as being obvious over Axberg and Sitka in view of U.S. Patent 5,854,102 to McChesney et al (McChesney).

Applicants have amended Claim 1. Claims 8, 9, 13, 14 and 15 depend upon independent Claim 1, and thus in effect each pending claim has been amended. These claims are allowable for at least the reasons discussed in connection with amended claim 1. Applicants respectfully disagree that these deficiencies are overcome by the Sitka reference. Applicants respectfully disagree that Sitka represent the same field of endeavor as Applicants invention. Applicants teach web-based management of a storage area network in which data is stored and retrieved

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using logical volumes. Sitka teaches non-web-based management of a file-based system for storage of images. Sitka teaches that web-based clients may retrieve images from the system but does not teach any participation in management of the system by the clients. Since Sitka does not represent the same field of endeavor as either Applicants invention or Axberg, and Axberg is not web-based at all, there is no motivation for a combination of the two references, or indeed for applying Sitka to Applicants invention. Applicants believe that the amended claims are not obvious because there is no teaching or suggestion to combine the references to provide an embodiment of Applicants claims, and even if combined the yielded embodiment would still not produce Applicants claimed invention.

Moreover, with respect to claim 8 as the Examiner indicates, nothing in Axberg teaches or suggests the use of a security component for limiting access by a client to one or more of the storage devices, or to a status of one or more of the storage devices. Nor would it make sense to include such a component in Axberg. In Axberg, only the manager or one of the agents can act as a client. The purpose of the manager is to produce a complete view of the network (Axberg, col 3, lines 32-42). And each agent needs to have a complete view of all of the storage devices accessible to its host in order to feed information to the manager (Axberg, col 3, lines 5-32), even if it does not have a complete view of devices contained in other hosts. There would be no motivation to include a security component such as Applicants disclose in Axberg.

Moreover, with respect to claim 13, Applicants respectfully disagree that either Sitka or Axberg disclose a plurality of storage management servers each connected between the host computers and the plurality of clients. Axberg uses a single storage management server to provide a coherent view of the entire storage network and does not teach or disclose adding

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additional management servers. There is no motivation in Axberg to do so, since Axberg relies on the existence of the single manager to resolve coherency issues. Sitka (Fig 7) shows a topology in which each DSM server serves a single DSM client, but no plurally connected servers.

Furthermore, with respect to claim 15, Applicants agree with the Examiner that neither Axberg nor Sitka discloses a name server. Applicants respectfully submit that these deficiencies are overcome by the McChesney reference. Applicants respectfully disagree that McChesney discloses a name server connected to each of the plurality of storage management servers. Applicants respectfully submit that the “network managers” mentioned in McChesney refer to human system administrators, not to management servers such as Applicants disclose (McChesney, col 2, lines 9-12). Each of McChesney’s name servers is connected to, and preferably embedded in a host computer and serves only the resources of that host, not the plurality of storage management systems and through it the entire storage area network (McChesney, col 5, lines 44-67). Moreover, since McChesney is not a system for managing storage at all but rather is directed toward a system for managing servers (McChesney, col 3, lines 4-9), Sitka is directed toward a file-based system for image storage and retrieval, and Axberg, is directed toward a graphical user interface display for configuring a storage network, there is no motivation for combining the three references, nor would Applicants invention as described in claim 15 result if they did.

For the reasons given above, Applicants respectfully suggest that Claims 1-20, are now in condition for allowance. Applicants hereby request reconsideration of all the claim rejections and allowance of amended Claims 1-20.

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Should the Examiner feel that a telephonic discussion may assist in furthering this matter toward issuance in due course or should the Examiner have concerns or questions, then the Examiner is invited to call the practitioner listed below at the number given.

Respectfully submitted,

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